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(54) Title: CLEAR STABLE AQUEOUS SOLUTION BASED UPON WATERGLASS FOR THE PRODUCTION OF FIRE RESISTANT GLAZING

(57) Abstract: Fire resistant glazings comprise a fire resistant interlayer based upon a silicate waterglass are characterised by the incorporation of aluminium ions. The aluminate is incorporated as a solution which has been partially neutralised using a hydroxy-carboxylic acid which is preferably citric acid. The incorporation of aluminium provides glazings have improved fire resistance and impact properties

INTERNATIONAL SEARCH REPORT

Internat	Application No
PCT/GB 03/03434	

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7	C03C17/00	C03C17/30	B32B17/06	C09K21/00	C01B33/32
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C03C B32B C09K C01B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>WO 02 24445 A (PILKINGTON PLC ;HOLDEN DAVID WILLIAM (GB); HOLLAND JOHN RICHARD (G) 28 March 2002 (2002-03-28)</p> <p>page 1, paragraph 1</p> <p>page 2, paragraph 3 -page 4, paragraph 3;</p> <p>claims 1-13; example 1</p> <p>---</p>	1-22
Y	<p>WO 01 70495 A (PILKINGTON PLC ;HOLDEN DAVID WILLIAM (GB); HOLLAND JOHN RICHARD (G) 27 September 2001 (2001-09-27)</p> <p>page 1, paragraph 1</p> <p>page 2, paragraph 2 -page 5, paragraph 6;</p> <p>claims 1-23; examples 1-15</p> <p>---</p> <p>-/-</p>	1-22

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

3 February 2004

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12.02.04

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/03434

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SAIDEN CHEM KK: "WPI WORLD PATENT INFORMATION DERWENT, DERWENT, GB", WPI WORLD PATENT INFORMATION DERWENT, DERWENT, GB, VOL. 1976, NR. 31 XP002151356 abstract ---	1-22
Y	US 4 190 698 A (BAUDIN POL ET AL) 26 February 1980 (1980-02-26) column 1, line 13-68 column 2, line 11-17 column 2, line 67 -column 3, line 8 column 4, line 7-20; claims 1-6 ---	1-22
A	WO 01 10638 A (PILKINGTON PLC ;HOLDEN DAVID WILLIAM (GB); HOLLAND JOHN RICHARD (G) 15 February 2001 (2001-02-15) page 2, paragraph 3 -page 3, paragraph 5; claims 1-18 ---	1-22
Y	GB 2 226 024 A (TIOXIDE GROUP PLC) 20 June 1990 (1990-06-20) page 2, line 1 -page 4, line 4; claims 1-31; examples 1-11 ---	23-27
Y	US 5 216 100 A (GRONDIN HENRI ET AL) 1 June 1993 (1993-06-01) column 2, line 54 -column 3, line 59; claims 1-8 -----	23-27

INTERNATIONAL SEARCH REPORT

Interr al application No.
PCT/GB 03/03434

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-22

I) 1st invention

The subject-matter of independent claims 1, 17,21,22 and respective dependent claims is concentrated on a clear, stable, aqueous solution based on waterglass and on uses of said solution as glazing. The core of the invention provides a solution wherein aluminate + hydroxy carbonylic acid is mixed with waterglass in order to improve the fire-resistance and the mechanical impact resistance properties of the glazing composition.

2. Claims: 23-27

II. 2nd invention

The subject-matter of independent claim 23 and the respective dependent claims is concentrated on a clear, stable solution comprising water soluble aluminate, hydroxy carbonylic acid and a polyhydroxy compound. The core of the invention provides a stable aluminate solution.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/GB 03/03434

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